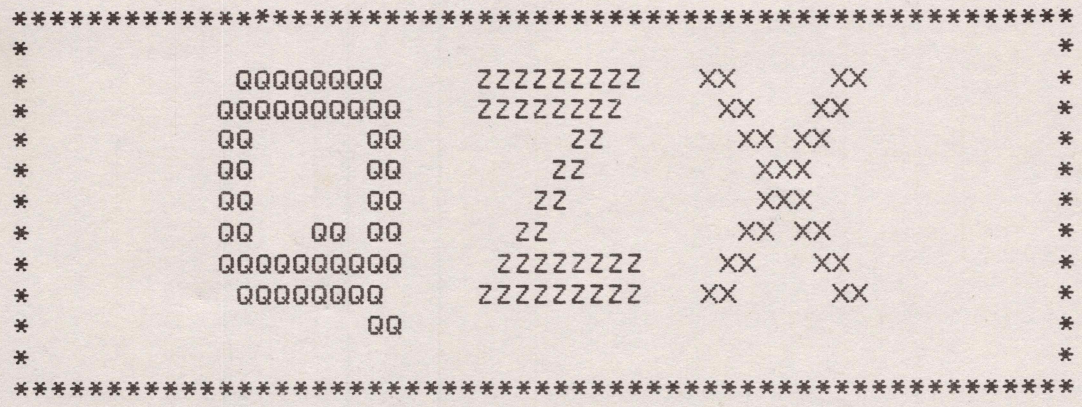
QQQQQQQQ ZZZZZZZZZ XX XX
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The Journal Covering Amateur Radio & Sinclair Computers
ZX-80; Micro-Ace; ZX81; T/S 1000, 1500, & 2068; QL
2025 O'Donnell Drive
Las Cruces, New Mexico
88001

K5XY
Alex. F. Burr
Publisher

W4GHV
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Volume 5 Number 12 ($1.50 - issue) November 1987

* CAT (RS232 for T/S 1000), LU8MAD
* WMJ Catalog
* Friends
* Unclassified Ads

TS 1000/ RS-232C - C.A.T.

This interface provides the user with a computer control for programming the YAESU FT-757 GX (or another CAT transceiver compatible) at 4800 baud via the 8251 A USART.

The circuit wich I will describe on this article, is a circuit known as a "Serial Interface" in RS-232C-convention for IN/OUT data.

In "TURN OR NOT TURN" (the second part of series), in the schematic diagram I have enclosed the serial interface part: 8251A USART, clock divider (three IC 4018), the TTL to RS232C converter MC1488 and the RS232C to TTL MC1489.

With exception of address decoder circuit part, all theory and circuit operation are similar as described in VIC RICE article (QZX Feb 1986).

The principal difference is the clock circuit will divide the clock rate of computer (3.25 MHZ) by 42 and by 4 to obtain 4800 Baud need for C.A.T. (computer-Aided Transceiver) but capable of switching to 1200 or 300 baud (under software control). In my interface prototype, I have set another switch between the pin 3 of IC 74LS08 and the actual switch (see Fig. 11) to drive pins 25 and 9 of USART with another frequency rate, derived from a 555 timer IC set to 800 and 1152 HZ for 50 & 72 baud RTTY (see QZX Vol 1, # 12, pag6; and QZX Vol 3, # 1, pag 6 for design). I have used for calibrate this oscillators the "Audio Frequency Counter Program" by c. MILAZZO (KP4MD) published in QZX of Octuber 1984.

USES OF INTERFACE

1) PACKET RADIO (1200/300 baud); 2)SERIAL PRINTERS (300 baud); 3) ASCII TERMINAL (300/1200/4800 baud); 4) RTTY (with aditional oscillator); 5) C.A.T (4800 baud); only your imagination limits you to its uses!

USE FOR CAT

With the ML (List 1) of second part ("Turn or not Turn") in 1 REM, and with switch of divider in position B for drive 4800 baud, you can operate FT-757 GX (or similar) with appropiate BASIC program and the small interface of Fig 7 .

The following simple BASIC program is usefull for testing the system.

```
 1 REM (same ML of rotator-control program)
10 RAND USR 16665
20 IMPUT A$
30 LET A$= "00000000"+A$
40 LET L = LEN A$/2
50 FOR X = 2 TO L * 2 STEP 2
60 POKE 16687,16 * CODE A$ (X-1) + CODE A$ (X) - 476
70 RAND USR 16688
80 NEXT X
90 GOTO 20
```

Run the program and imput one of the following commands:

A$="Ø1" ; SPLIT - VFO A/ VFO B Split ON and OFF
A$="Ø2" ; MR / VFO - Exchange operating frequency between memory and VFO
A$="Ø3" ; V→M - Write VFO data into memory
A$="Ø4" ; D LOCK - Lock tuning dial
A$="Ø5" ; VFO A/B - Exchange operation between VFO's A and B
A$="Ø6" ; M→V - Write memory data into operating VFO
A$="Ø7" ; 500 UP - Step up 500 KHZ (Band Up)
A$="Ø8" ; 500 DWN - Step down 500 KHZ (Band Down)
A$="Ø9" ; CLAR - Activate or deactivate clarifier
A$="ØB" ; V ⇄ M - Exchange frequency data between VFO and Memory

Direct keyboard frequency entry (Freq. set "ØA") is not available with above program, then replace line 30 with the following:

```
30 LET A$ = A$(7 TO 8)+A$(5 TO 6)+A$(3TO 4)+A$(1 TO 2)+"ØA"
```

Imput frequency in the form of 8 digits (**)
Example:
a) to set 14.15000 MHZ, imput "01415000"
b) to set 7100.00 KHZ, imput "00710000"

SCANNER

The same program can be upgraded to provides scanner utility, then enter the following changes:

```
 20 GOTO 100
 90 RETURN
100 IMPUT C$
110 LET C$=STR$(VAL C$+1000)
120 IF LEN C$=4 THEN LET C$="0000"+C$
130 IF LEN C$=5 THEN LET C$="000"+C$
140 IF LEN C$=6 THEN LET C$="00"+C$
150 IF LEN C$=7 THEN LET C$="0"+C$
160 PRINT AT 10,7; C$
170 LET A$ = C$
180 GOSUB 30
190 GOTO 110
```

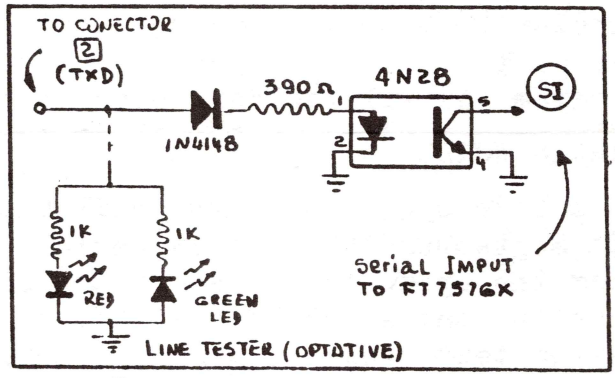

Fig. 7

- Run this program. An inverse L prompt appears at the bottom of the screen
- Imput C$ (the start scan frequency) in similar form to (**)
- Value 1000 in Line 110 (can be changed) increment frequency in step 10KHZ

I have adapted, with minor corrections my programs CAT PROGRAM and SCANNER (QZX May 1986) for the actual serial interface, and change the names to: "TOM-CAT" and "FELIX-CAT" respectively. These works 100% OK with all lights and whistles.

THE BIG IMPROVEMENT

As can be seen by the foregoing part, in Machine Language routine in Line one of BASIC program, instructions from address 16514 to 16664 are for Rotator Control and 16665 to 16693 for CAT. Now, part of routine used for Rotator Control can be utilized with scanner.

Return signal from the FT-757GX provides analog signal output ranging from + 0.4V DC during strong signal reception, to + 2.6 V DC when no signal is being received.

This return signal from transceiver provides a digital information that may be used to stop the scanner program on "preset" signal strengths from S1 to S9.

Fig. 12 is a suggestion of circuit complement for Rotator Control / CAT interface (see part 2).

An output in port PB3 (pin 21 of 8255A) activate relay 4, which switch on AGC line of transceiver into Digital/Analog converter, and switch off imput from the position-sense potentiometer.

I belive that software may be reduced to a few poke's and BASIC lines.
Likewise, the threshold of signal strenght can be fixed between Ø & 255 DV (similar to desired rotator position).

I will search this improvement and next time I hope send some information
Some suggestion ?

PC BOARD

I have enclosed parts-placement guide and PC board layouts with single-side copper foil. This PC may be upgraded if you use double side board drawing all absents traces, then you will use the PC board layout how start point of your design.

Likewise for my etching pattern of PC board several jumpers of isolated wire are required in foil side, soldered sometimes between specific slots. Circles (o- or -o) show the location of solder point -"NOT HOLE"-, his counter part are holes through PC board (-o or o-). So that following schematic diagram you will solder point to point completely all absents connections.

FINALS WORDS

I have upgraded KA1VW ASCII and BAUDOT programs (see QZX Vol 3, # 1; or QEX September 1984) to my serial interface of present article. In both program the upper ten lines of the display show the received text, printed on line ten and scrolled automatically; line 11 is blank and separates the received text from the transmit buffer text; the next ten lines display the contents of the transmit buffer. The carriage return and line feed signals are automatically sent after each set of 63 characters. You can define 25 strings B$ to Z$ (you keep it under 256 characters). So you can define various strings explicitly for RY's, CQ's, brag, ID or whatever.

Also I have written ML into 3 REM statement in my NRAP (RTTY-ASCII program by C.NUNNERY NU4V) that transmit via RS-232 at 4800 baud (with CAT interface) the receive buffer to another computer (ZX81) with RS232 and 64 K. Then ZX81 delivery the string into my SEIKOSHA serial printer slowly at 300 baud, and the TS1000 reset the receive buffer and continue working.Confused?

CORRECTIONS TO THE PREVIOUS ARTICLE

Don't panic !

Pin 3 (RXD) of 8251A should be connected to pin 3 of MC1489 (IC6) instead of pin 8. Also pin 17 ($\overline{CTS}$) of the 8251A should connected to pin 8 of MC1489

Unnamed resistor of IC8 have a value of 20 KΩ (10K+10K) in prototype, this must be adjusted at value that delivery from pin 6 of IC8 to PC4 of 8255 just <= 5V DC.

I have discovered a mistake in clock divider scheme. Fig.10 is the correct version. IT'S ALL (I belive) 73's from LU8MAD,Guillermo

WINTER 1988 TIMEX/SINCLAIR SOFTWARE CATALOG

****

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See TS2068 section for details on these programs:

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TS1000 MUSIC LIBRARY (Prod# TS1ML) $14.00.
TS1000 PHONE BOOK (Prod# TS1PB) $14.00.
TS1000 MEMBERSHIP DIRECTORY (Prod# TS1MD) $14.00

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TX4	BUDGETER	TX17	MIXED GAME BAG 1
TX5	CAPITALIZATION MASTER	TX18	PUNCTUATION MASTER
TX6	CHALLENGER	TX19	STATE AND CAPITALS
TX7	CHECKBOOK MANAGER	TX20	STOCK MARKET ANALYZER
TX8	CHESS	TX21	STOCK MARKET GAME
TX9	CONVERSATIONAL GERMAN	TX22	SUPERMAZE
TX10	COUPON MANAGER	TX23	SUPER MATH
TX11	CUBE GAME	TX24	TOTAL TRIANGLES
TX12	FORTRESS OF ZORLAC	TX25	TRAP
TX13	GAMBLER		

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DIAMOND MIKE (Prod# TS2DM) $16.95. This is simply the Best game we have seen for the TS2068. Excellent graphics, speed, sound, music, color... Try this game we guarantee that you will have hours and hours of fun! Joystick optional.

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GRIDRUNNER (Prod# TS2GRID) $15.95. A fast arcade game that is not unlike Centipede. You control the ship. There are Gridsearch Squads who run in line accross each grid and quickly descend to the next one. If you knock them off one at a time and in order you are OK, but if you split them in the middle then they become harder to destroy. There are also X and Y zappers and the Pods. The object is to clear the grid of this pest or die trying. Joystick optional.

THE HANDICAPPER $16.95. Try your skill at the race track. These programs should help you increase your winnings at the race track. Three versions available: Thoroughbred (Prod# TS2HT), Harness (Prod# TS2HH), and Greyhound (Prod# TS2HG). Please order specific version by Prod#.

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SABOTEUR (Prod# TS2SAB) $15.95. You are a highly skilled mercenary trained in the martial arts. You have to infiltrate a central security building which is disguised as a warehouse. You must steal a computer disk that contains the names of all the rebel leaders before its information is sent to the outlying security stations. You are working against the clock, both in getting to the disk and in making your escape. You must enter the building from the sea by rubber dingy and will then only be able to leave by the helicopter on the roof. You will have to find you way around the warehouse, making use of the guards own weapon supplies in your struggle through overwhelming odds.

SMUGGLER'S COVE (Prod# TS2SMUG) $13.95. A pirate adventure with text and high resolution graphics. This game features twenty-seven locations, sixty-five objects, and three levels of escape. The object is to escape from the cove with the maximum points using the best route while overcoming the pirates and sea monsters.

SNOWMAN (Prod# TS2SNOW) $15.95. In this game you have to build a snowman to amass points, but you must avoid the flame. To get extra points pick up the flashing objects, but watch for the Sleep Monsters, they will put you to sleep when you least expect them to. Don't fall off the ledge! Joystick optional.

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TRADER TRILOGY (Prod# TS2TRDR) $15.95. The Trader Trilogy is 3 programs consecutively loaded that combine to give an epic graphic adventure. You take the part of an intergalactic salesperson doing the rounds of the Meridian. The life is tough, bargaining hard, and hazards galore! You could make it to the top, or end up a Deltan H--- Hole! You'll need your pad of paper and a calculator for this one!

TRAXX (Prod# TS2TRAX) $15.95. Fast Action Game! You have to capture the squares for points. If you capture all 4 corners of the grid you get 10 seconds to eat the bugs. 9 speeds of action. Joystick optional.

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TS2068 Software

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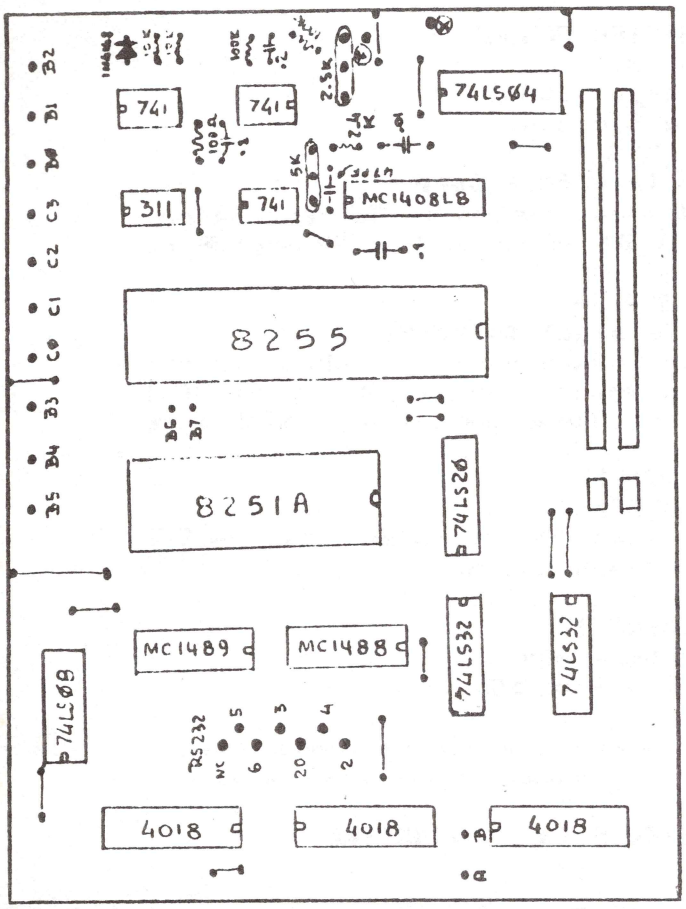

Fig. 8

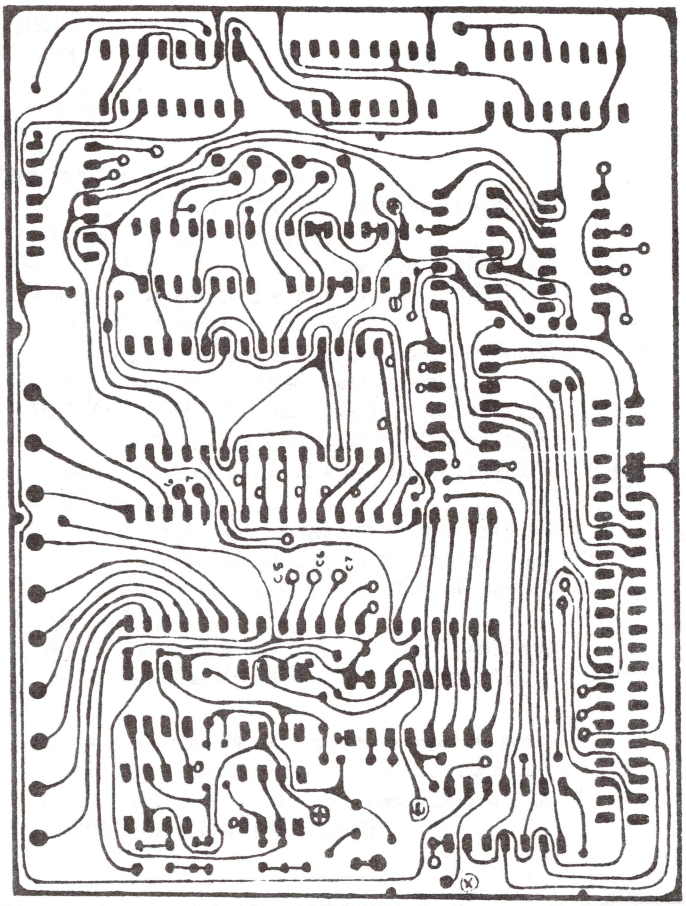

Fig. 9

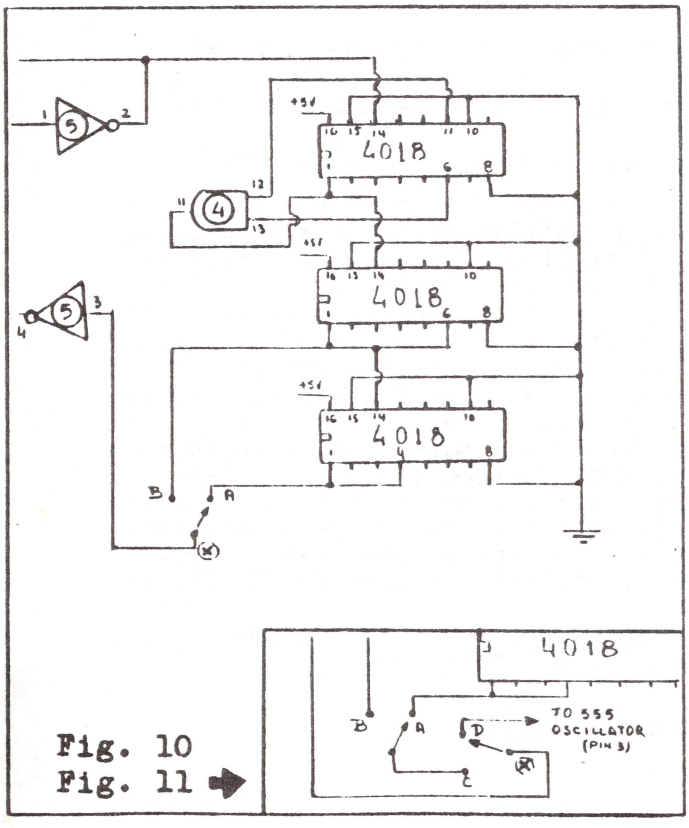

Fig. 10
Fig. 11

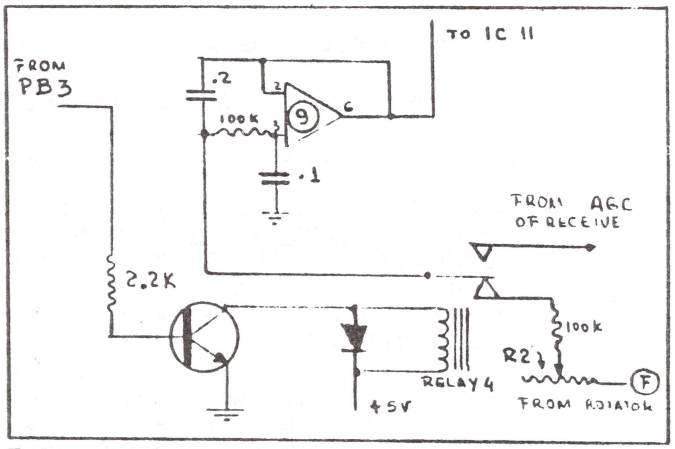

Fig. 12

CAUTION

WHAT THE DIAGRAMS NOT SHOW EFFECTIVELY IS THE NEEDS TO PUT DECOUPLING CAPACITORS, USUALLY OF .1 TO .01µF ACROSS THE POWER FEEDS TO EACH INTEGRATED CIRCUIT

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QZX FRIENDS

N9GIH -- Ken says that he has been so busy upgrading that he has not had time to use his ZX 81.

W6OOA -- Al is another reader who particularly likes WA6DLI's articles. He has a T/S 1000 with 16 K RAM. He uses it with the NU4V CWSS program to send the preamble to the cw net of which he is NCS.

W4FCJ -- Smithy writes that "My T/S 1000 and T/S 2068 continue to perform well, especially for data communications. I have incorporated an internal 64k RAM in my T/S 1000. With this modification, along with the addition of a TI keyboard, I now have a very reliable computer. My T/S 2068 continues to perform well on packet, both HF and VHF, with a modified MFJ-1270 TNC-2. Recently, I built a TAPR 1200 baud PSK modem, and use the T/S 2068 to copy the Fuji Oscar 12 satellite. PSK works with weak signals that are barely audible."

K7JGR -- Ed sent us a long article from a stamp magazine columnist who keeps his stamp collection organized on a T/S 1000 and writes his articles on a T/S 2068.

K0OV -- Joe has just published a book on transmitter hunting which describes the use of a ZX 81 as part of a mobile high-accuracy triangulation system for direction finding. He also includes in the book two BASIC programs for triangulation using ordinary road maps.

KA1LM -- Stephan has just moved to Virginia. He has picked up a QL and color monitor for use on packet to replace the ZX 81 and Comlink I now used.

K9AYP -- Louis is using his T/S 1000 on packet with the Comlink I. He says that his T/S 2068, which he uses for programing, makes his C-64 look like a dinosaur.

W*6AST -- Kenneth has retired from California and moved to Great Britain. He is in the process of setting up his T/S 2068 and has promised us a report on the various British RTTY programs. He has seen ads offering the Spectrum with c/w interface, cassette recorder, joysticks, and games for about $110. He has also spotted the latest Sinclair computer, (the ZX 88, a lap top computer), in the stores. (The previous note on a stamp collector caused me to look closer at the stamp on Kenneth's letter. Great Britain is the only country that I know which is so egotistical that the stamp includes absolutely no printing that indicates the country of origin. The best that it does is an old profile of Queen Elisabeth II.)

K8NZZ -- Bob renewed and asked for some ham software for the QL. A number of our readers use the QL so perhaps they can send in some of their programs. They do not have to be sophisticated, just detailed so anybody can duplicate the results. Perhaps a logging program for Arkive or a QSL design program for Easel.

UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

WANTED: Copy of Z-XLR8 program (high speed) with instructions. In return I will send a cassette with "DXCC-ROTATOR CONTROL", "CAT", "SCANNER" AND "TERMINAL" (all programs for the interface given in my articles in QZX). Send to Guillermo Garcia, LU8MAD, Cabildo 584, (5521) Mendoza, ARGENTINA.

FOR SALE: Index to QZX consisting of a bound book of xerox copies of all the covers since December 1982. Send $5.00 plus $1.00 shipping and handling ($2.00 if to a non-US address) to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FOR SALE: ZX Spectrum computer 48 K color & sonnd with 60 Hz 120 V supply. Computer output on ch. 33 UHF TV band. Complete package w/ prints and manuals, some software. $75.00 mint cond. James Zilvilis WA1JBS, 46 Hart St., Watertown, Conn 06795.

WANTED: I would like to receive correspondence from Sinclair 1000 owners who have had experience with Eckhardt's "COMLINK I" device and Microlog's "SWL" device. Gerald C. Stillman, 128 Highland Ave., Salem, MA 01970.

73, W4GHV & K5XY

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